

haptic sensations are output directly on the touchpad or screen. For example, the touchscreens and touchpads disclosed in applicant's U.S. Pat. No. 6,429,846 can be coupled to bending, inertial shaker, or linearly-moving EAP actuators as disclosed herein rather than, for example, piezoelectric actuators. Tactile computer keyboards and keypads (as disclosed in applicant's U.S. Pat. No. 6,693,626) direction pads on gamepads (as disclosed in applicant's U.S. Pat. No. 6,563,487), and other interface devices may be used with the EAP actuators.

[0124] While the subject matter has been described in terms of several preferred embodiments, it is contemplated that alterations, permutations and equivalents thereof will become apparent to those skilled in the art upon a reading of the specification and study of the drawings. For example, many different types of haptic sensations can be provided with the actuators. Furthermore, certain terminology has been used for the purposes of descriptive clarity, and not to limit the scope of the claims.

What is claimed is:

1. A stylus comprising:
 - a body having a first end and a second end opposite from the first end, the first end having an aperture;
 - a tip positioned within the body and adapted to move between a first position and a second position, wherein the tip is exposed through the aperture when in the second position; and
 - an electro active polymer actuator coupled to the tip and configured to move the tip from the first position to the second position upon being activated.
2. The stylus of claim 1 wherein the stylus is operable with a graphical user interface having a graphical object manipulatable by the stylus within the graphical user interface, wherein the electro active polymer is activated in response to an interaction between the graphical object and the stylus.
3. The stylus of claim 2 wherein the stylus is operable with the graphical user interface displayed via a touch contact surface, wherein the stylus manipulates the graphical object via the touch contact surface.
4. The stylus of claim 3 wherein the touch contact surface is a touch pad.
5. The stylus of claim 3 wherein the touch contact surface is a touch screen.
6. The stylus of claim 1 wherein the electro active polymer repeatedly moves the tip between the first and second positions to produce a vibration.
7. The stylus of claim 1 wherein the electro active polymer produces a haptic feedback upon being activated.
8. A stylus comprising:
 - a body having a first portion and a second portion, wherein the first portion is moveable with respect to the second portion;
 - an electroactive polymer coupled to the first portion and the second portion, wherein the electroactive polymer is configured to linearly move the first portion from a first position to a second position with respect to the second portion upon being activated.
9. The stylus of claim 8 wherein the first portion further comprises a tip and the second portion further comprises a

housing of the stylus, wherein the tip is positioned within the housing in the first position and extends out an aperture on an end of the housing when in the second position.

10. The stylus of claim 8 further comprising a bellows coupled to the first and second portions, wherein the bellows is configured to move between a compressed state and an expanded state, the first portion configured to move a distance away from the second portion in response to the bellows moving from the compressed state to the expanded state.

11. The stylus of claim 8 wherein the stylus is operable with the graphical user interface displayed via a touch contact surface, wherein the stylus manipulates the graphical object via the touch contact surface.

12. The stylus of claim 11 wherein the touch contact surface is a touch pad.

13. The stylus of claim 11 wherein the touch contact surface is a touch screen.

14. The stylus of claim 8 wherein the electro active polymer repeatedly moves the tip between the first and second positions to produce a vibration.

15. The stylus of claim 8 wherein the electro active polymer produces a haptic feedback upon being activated.

16. A stylus comprising:

- a body having a first end and a second end opposite from the first end;
- a moveable member coupled to the body and capable of being in contact with a user's hand; and
- an electro active polymer actuator coupled to the moveable member, wherein the electroactive polymer moves the moveable member from a first position to a second position with respect to the body upon the electro active polymer being activated.

17. The stylus of claim 16, wherein the moveable member further comprises a tip positioned within the housing in the first position and extends out an aperture on an end of the housing when in the second position.

18. The stylus of claim 16 further comprising a bellows coupled to the moveable portion and the body, wherein the bellows is configured to move between a compressed state and an expanded state, the moveable portion configured to move a distance away from the body in response to the bellows moving from the compressed state to the expanded state.

19. The stylus of claim 16 wherein the stylus is operable with a graphical user interface having a graphical object manipulatable by the stylus within the graphical user interface, wherein the electro active polymer is activated in response to an interaction between the graphical object and the stylus.

20. A stylus comprising:

- a body having a first end and a second end opposite from the first end;
- an electro active polymer actuator coupled to the body and located on an outer surface of the body, wherein the electroactive polymer is configured to expand a first position to a second position with respect to the body upon the electro active polymer being activated.

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